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ABSTRACT

A study identified competencies high school industrial arts courses can develop that would be valuable to students who enroll in postsecondary programs. Its purpose was to develop a basis for recruiting students for high school industrial arts courses. Data were collected through a national survey of directors of one- and two-year postsecondary vocational programs, industrial arts teacher education programs, and industrial technology programs. The 10 most important competencies identified by the educators surveyed were problem-solving skills, effective work habits, responsibility, ability to work effectively with others, safe working procedures, interest in learning, self-confidence and self-esteem, ability to use mathematics and science to solve technical problems, oral and written communication skills, and role and impact of technology in the world. A number of skills unique to industrial arts courses were identified as important, including skill in using basic tools and machines, measurement, drafting, and processes skills. Industrial arts teacher educators also identified the most important teaching competencies that can be developed: desire to teach, ability to organize information and present it to others, concern for others, understanding of the teaching profession, and ability to demonstrate and teach skills to others. (The study instruments are appended.) (YLB)

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Competencies Developed In Industrial Arts That Are Relevant To Post-Secondary Programs

by

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Competencies Developed In Industrial Arts That Are Relevant To Post-Secondary Programs

This paper presents the results of a study conducted to determine competencies high school industrial arts courses can develop that would be valuable to students who enroll in post secondary programs. The purpose of this study was to develop a basis for recruiting students for high school industrial arts courses.

Data were collected through a national survey of directors of one- and two-year post-secondary vocational programs, industrial arts teacher education programs, and industrial technology programs. The final survey was conducted in September, 1985. Response rate to the survey was 60 percent.

The ten most important competencies identified by the educators surveyed are listed below:

- Problem-solving skills
- Effective work habits
- Responsibility
- Ability to work effectively with others
- Safe working procedures
- Interest in learning
- Self-confidence and self-esteem
- Ability to use math and science to solve technical problems
- Oral and written communications skills
- Role and impact of technology in our world

All of these were placed in the very important category. Several of these are not the sole province of industrial arts. However, industrial arts courses can make a unique contribution to the development of each of these.

A number of skills that are unique to industrial arts courses were identified as important. Skill in using basic tools and machines was rated just slightly lower than the ten competencies just listed. Measurement, drafting and processes skills were also identified as important.

The most important teaching competencies that can be developed as identified by industrial arts teacher educators are listed below:

- Desire to teach
- Ability to organize information and present it to others
- Concern for others
- Understanding of the teaching profession and what is expected of a teacher
- Ability to demonstrate and teach skills to others

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COMPETENCIES DEVELOPED IN INDUSTRIAL ARTS THAT ARE RELEVANT TO POST-SECONDARY PROGRAMS

Introduction

The purpose of this study was to identify the competencies that could be developed in high school industrial arts courses which would be of value in post-secondary vocational, technical and teacher education programs. Coordinators and directors of a sample of these post-secondary programs were contacted by a mail survey to determine the competencies they thought would be important in their programs. A modification of the Delphi Process was used to design the survey instruments.

Problem

The problem of this study was to develop a prioritized list of competencies, skills and attitudes that could be developed in high school industrial arts courses which would be valuable in post-secondary vocational, technical and industrial arts teacher education programs.

Objectives

The study was designed to meet the following objectives.

1. Identify the knowledges acquired in high school industrial arts courses that are valuable to post-seconday vocational, technical, and teacher education programs.
2. Identify the skills developed in high school industrial arts courses that can be valuable in post-secondary vocational, technical, and teacher education programs.
3. Identify the attitudes and work habits which can be developed in high school industrial arts courses which are valuable to post-secondary vocational, technical, and teacher education programs.

4. Develop a prioritized list of the knowledges, skills and attitudes based on their importance in post-secondary programs.

Need for the Study

Since 1980, there have been increasing pressures for students to enroll in more math, science and communications skills classes. These pressures have grown out of several national studies conducted on the status of education in the United States and from a back-to-the-basics movement. As a result, States have increased their high school graduation requirements. Typically these changes in requirements do not increase the number of industrial arts courses required for graduation. Rather, they increase the number of math, science and English courses required. This leaves students with few elective courses. And, industrial arts must compete for students with other elective courses.

If industrial arts teachers are going to be able to counter these trends, they must be able to present a strong argument for enrolling in their courses. This study provides information on the usefullness of competencies developed in industrial arts for students who enroll in post-secondary vocational, technical or teacher education programs. This information should be helpful in recruiting students for industrial arts courses.

Approach

Design

Based on the nature of the objectives of the study and resources available, a mail survey research design was selected. The Delphi technique was used to structure the design of the study (Nelson, 1982). Two surveys were used in this study. The first round or first survey was sent to a sample of post-secondary T & I coordinators and the heads of industrial teacher education departments to determine the types

of industrial arts teacher education departments to determine the types of competencies they thought high school industrial arts could develop which would be useful in their programs. This information was used to design a rating scale which was sent to the same sample.

Population and Sample

Two populations were involved with the study. One population was comprised of the T & I coordinators for post-secondary vocational-technical programs in the United States. A sample of these coordinators was selected for the study. This sample was selected with the cooperation of the T & I consultants in the state departments of education throughout the 50 states. Each state-level T & I consultant received six copies of the first-round survey with the request that these be distributed to a representative cross-section of T & I coordinators for post-secondary programs. Those who responded to this initial survey also received a copy of the second-round survey.

T & I coordinators from 20 states responded to the initial survey. To account for those states not responding, a sample of ten states was elected from those that did not respond. State-level T & I consultants from these ten states received six copies of the second-round survey instrument with the request that they distribute these to a representative cross-section of post-secondary T & I coordinators in their states.

As a result of this process, responses were received from T & I coordinators in 25 states. The second population used in the study was the heads of industrial arts teacher education departments. These people were identified through the use of the Industrial Teacher Education Directory (Dennis, 1984). A 100 percent sample was used for this population. Surveys were sent to 170 department heads. Responses were received from 82.

Survey Instrument

As noted in the design section, the survey instrument was deveoped using the Delphi technique. The first-round survey consisted of several open-ended questions. A copy of the survey is included in Appendix A. Respondents were asked to identify two or three competencies or skills that fit into each of the areas identified by the questions.

Responses to the first instrument were typed on 3 x 5 cards. These cards were sorted by the researcher to identify unique competencies. These competencies were used to establish a rating scale for the second survey. A copy of this instrument is included in Appendix B. On this survey instrument the respondents were asked to circle the level of importance of each competencies listed. At the end of each section, they had an opportunity to add additional competencies. After completing each section, they were asked to go back and identify the four or five most important competencies in the list.

Respondents were also asked to identify the type of program for which they were responsible. This permitted more specific analysis of the data.

The first-round survey was distributed during April, 1985. The second survey was mailed during the later part of September, 1985.

Data Analysis

As just described, the responses to the first survey were placed on 3 x 5 cards and sorted into unique categories. These responses were used to identify the competencies to be listed in the second survey. The researcher also kept a summary of the number of cards in each stack. This was a general index of the level of importance placed on the competencies identified. For instance, the ability to solve technical problems was a frequently identified competency in the first survey.

The second survey was designed to permit computer analysis of the data. Responses on this survey were processed using the School of Industry and Technnology software and computer system at UW-Stout. Basic descriptive statistics were generated for each competency listed. Cross tabulations or subgroup analyses were run for each of the programs represented by the respondents.

Results

Responses to the surveys were analyzed by respondent group. Table 1 presents a summary of the positions or groups represented by the respondents. Industrial arts/technology education teacher educators was the largest group of respondents (43 percent). The next largest group (26 percent) was comprised of vocational educators from one and two year post-secondary vocational and technical programs. A small number of those responding (6 percent) indicated they were in vocational teacher education departments. A summary of the responses from this group is included in the section on teaching skills. It is not reported separately in the other tables since its response patterns are similar to those of the industrial arts/technology teacher education group.

Knowledge

The most important knowledge areas that industrial arts can develop are:

- problem solving techniques
- safe working procedures
- human relations skills
- written and oral communication techniques and skills used in industry
- role and impacts of technology in our society

TABLE 1

Survey Respondents' Positions

Respondents' Positions	Results %	Results N
One- or Two-Year Post-Secondary Vocational-Technical Program	26	36
Industrial Arts/Technology Education Teacher Education Program/Dept	43	60
Vocational Teacher Education Program/ Department	6	9
Industrial Technology (nonteaching)	9	13
Other	9	13
Omit	7	10
Total	100	141

Each of these had 32 percent or more of the total group respond that it was one of the five most important competencies listed. Problem solving was by far the most important with 66 percent selecting it as one of the top five. The average response for these items was 4.7 or above which placed them in the "very important" range. These five were given top priority by all groups of respondents.

Only three of the competencies were rated in the "moderately important" range. Management techniques (28), entrepreneurship (27), and history of tools and technology (25) were placed at this level of importance.

Table 2 presents a summary of the responses to the knowledge areas listed in Section 1 of the survey. The items in Table 2, and succeeding tables, are listed in order of importance based on the responses of all respondents. In Table 2, the "total" column presents a summary of the ratings made by all respondents. The column headed "V-T" presents a summary of the responses of persons in one or two year post-secondary vocational-technical schools. Industrial arts/technology education teacher educators responses are summarized in the "TED" column. In the last column, "IT", the responses of persons in college industrial technology programs are summarized. Nine vocational teacher educators also returned surveys. Their responses were very similar to those of the other teacher educators. Thus, their responses are reported only in the table that presents the teaching skills.

A variety of important knowledge based competencies are listed in Table 2. Almost all were rated as important or very important. There are some variations in emphasis by respondent group. Readers should review the response summary of the group that most closely matches their interests.

TABLE 2

Knowledge That High School Industrial Arts Courses Could Develop

RANK	Knowledge	Importance TOTAL $\bar{X}$	TOTAL %MI	V-T $\bar{X}$	V-T %MI	T ED $\bar{X}$	T ED %MI	IT $\bar{X}$	IT %MI
•	Develop knowledge of								
1.	problem-solving techniques.	5.4#	66@	5.6	72	5.5	70	5.1	54
2.	safe working procedures	5.0	43	4.9	39	5.0	43	4.5	31
3.	human relations skills.	4.7	38	5.2	58	4.5	32	4.3	23
4.	written and oral communications techniques and skills used in industry	4.7	33	4.8	42	4.6	25	4.8	31
5.	the role and impacts of technology in our world .	4.7	32	4.3	8	5.0	42	5.0	62
6.5	career opportunities in technical occupations . .	4.5	26	4.8	36	4.4	23	4.5	15
6.5	basic applications of math in technology.	4.5	26	5.1	47	4.3	13	4.5	23
8.	basic applications of science in technology . . .	4.4	23	4.2	17	4.5	25	4.6	38
9.	change - its impacts on one's personal life and society; and the need to adapt to change.	4.2	22	4.2	19	4.1	15	4.3	31
10.	how industry is organized and functions	4.1	16	3.6	8	4.2	10	4.7	38
11.	computer applications in industry	4.2	15	4.1	14	4.4	18	4.2	8
12.	communications concepts	4.3	15	4.3	19	4.3	13	4.4	31
13.	basic materials and processes	4.1	13	3.7	6	4.3	20	4.2	8
14.	basic drafting techniques and concepts.	4.0	13	3.7	11	4.0	12	4.1	15
15.	job-seeking skills.	3.8	13	4.4	28	3.5	8	3.8	8
16.	basic manufacturing concepts.	4.0	11	3.6	8	4.2	13	4.0	15
17.	new manufacturing systems such as Computer Integrated Manufacturing (CIM), Flexible Manufacturing (FMS), etc.	3.9	10	3.4	6	4.3	15	4.0	8
18.	basic technical terms	4.1	9	4.0	8	4.1	8	4.3	15
19.5	the nature of craftsmanship	3.7	9	4.0	25	3.5	2	3.9	15
19.5	the free enterprise system.	3.7	9	3.2	3	3.9	12	3.9	15
21.	career opportunities in industrial arts teaching.	3.6	9	2.9	0	4.1	18	3.1	0
22.	basic construction concepts	3.8	5	3.3	0	4.0	7	3.9	8
23.	basic energy concepts	3.9	4	3.4	3	4.1	7	3.6	0
24.	transportation concepts	3.7	4	3.1	0	4.0	8	3.7	0
25.	the history of tools and technology	3.2	4	2.9	3	3.4	3	3.5	8
26.	costing materials, supplies and labor.	3.5	3	3.4	3	3.4	2	3.8	8
27.	entrepreneurship - procedures and problems involved in starting your own business.	3.3	2	2.9	0	3.5	3	3.4	0
28.	basic management techniques	3.3	1	2.8	0	3.5	0	3.4	0
	N		141		36		60		13

#Means are based on the following scale: 1 = NI = Not Important; 2 = SI = Slight Importance; 3 = MI = Moderate Importance; 4 = I = Important; 5 = VI = Very Important

NOTE: The total column is based on the responses of all participants

@%MI = Percentage of respondents selecting the knowledge as one of the five most important.

In addition to the top five knowledge areas listed previously, the following received average ratings of 4.1 or larger from the total group.

- Career opportunities in technical occupations
- Basic applications of math in technology
- Basic applications of science in technology
- Change - its impacts on one's personal life and society, and the need to adapt to change
- How industry functions and is organized
- Computer applications in industry
- Communications concepts
- Basic materials and processes

The importance of career information is noted by its 4.5 average response. Also, career opportunities in teaching received an average rating of 4.1 from the teacher education groups. Comments on the first survey indicated that this was an important area of knowledge. The importance of math, science and computers in technology is apparent.

Several of these competency areas, math, science and communications for example, involve other disciplines. However, the applications to technology are unique to industrial arts. In addition, a number of technical knowledge areas received average ratings in the important range.

Based on the survey results, it is apparent that high school industrial arts classes can develop a variety of knowledge competencies that are valuable to students who enroll in post-secondary programs in technical areas.

Attitudes, Values and Interests

At the top of the priority list of attitudes, values and interests were:

- Interpersonal skills - ability to work effectively with others
- Self-confidence and self-esteem
- Responsibility
- Interest in learning
- Honesty

All of these had a mean response of five or more. (See Table 3.) In other words, they were rated "very important." There were some variations in emphasis by respondent group. "An appreciation of the importance of work" was rated the highest by faculty in industrial technology programs.

The importance of pride in work (8) and appreciation of work (7) is identified by their "very important" ratings. Interest in technology (9), safety (10), and self-discipline (6) were also given this priority. All but one of the attitudinal competencies in the survey received mean ratings of 3.6 or higher. This placed all but one of the competencies in the "important" or "very important" range.

Developing an interest in student organizations was the lone interest that received a mean rating of less than 3.5. This appeared to be somewhat inconsistent since student organizations are used to develop a number of the competencies and attitudes that were deemed to be very important.

TABLE 3

Attitudes, Values, and Interests That High School Industrial Arts Courses Can Develop

RANK	Attitudes, values and interests	Importance							
		TOTAL		V-T		T Ed		IT	
		$\bar{X}$	%MI	$\bar{X}$	%MI	$\bar{X}$	%MI	$\bar{X}$	%MI
•	Develop a/an								
1.	interpersonal skills - ability to work effectively with others.	5.3#	61@	5.5	75	5.2	55	4.5	38
2.	self-confidence and self-esteem.	5.0	48	5.1	50	5.1	47	4.6	38
3.	responsibility	5.2	45	5.2	44	5.1	40	5.1	46
4.	interest in learning	5.0	43	4.9	31	5.0	43	5.0	54
5.	honesty.	5.0	36	5.3	50	5.0	37	4.5	31
6.	self-discipline.	4.8	33	4.8	28	4.7	28	5.2	46
7.	appreciation of the importance of work	4.7	33	4.9	33	4.5	25	5.5	69
8.	pride in their work.	4.8	27	4.9	31	4.8	23	4.7	23
9.	interest in learning about technology.	4.5	23	4.1	3	4.8	42	4.5	23
10.	positive attitude toward safety.	4.7	21	4.6	14	4.8	28	4.2	8
11.	interest in working cooperatively with others. . .	4.6	21	4.6	17	4.8	27	4.5	31
12.	respect for other people and their views	4.6	19	4.8	28	4.6	18	4.5	23
13.	appreciation of craftsmanship.	4.2	18	4.6	31	3.9	10	4.2	15
14.	mental set that encourages curiosity	4.4	14	4.2	6	4.6	20	4.0	8
15.	desire to "do it right the first time"	4.3	13	4.7	28	4.0	7	4.2	15
16.	interest in technical careers.	4.0	11	3.9	8	4.1	13	4.3	23
17.	interest in design and esthetics	3.8	4	3.5	3	3.9	3	3.7	8
18.	positive attitude toward profit.	3.6	3	3.8	3	3.4	2	3.7	8
19.	interest in student organizations.	3.3	3	3.0	3	3.4	3	2.9	0
		N	141		36		60		13

#Means are based on the following scale:

1 = NI = Not Important
2 = SI = Slight Importance
3 = MI = Moderate Importance
4 = I = Important
5 = VI = Very Important

NOTE: The total column is based on the responses of all participants.

@%MI = Percentage of respondents selecting the attitude, value, or interest as one of the five most important in this section.

It would appear industrial arts can make a significant contribution to the development of attitudes, values and interests that are important in post-secondary programs. An appreciation of the importance of work and craftsmanship, interest in technology, and self-confidence can be developed in industrial arts. The ability to work effectively with other people is also a natural result of many activities in industrial arts classes.

Skills

Top priorities in the list of skills were given to:

- Problem solving
- Effective work habits
- Apply math and science to technical problems and tasks
- Communicating effectively (writing and speaking)
- Competency in working with people

All of these skills were also given top priorities in the knowledge and attitudes sections.

Respondents also indicated that skill in using tools and equipment safely, study skills, and locating and using technical information were very important. Slightly lower, but important, priority ratings were given to skill in using basic tools and machines, leadership, measuring skills, and evaluating one's work. See Table 4 for a summary of all ratings.

All of the skills listed were rated as important or very important. Some of the skills are unique to industrial arts. For example, safe and skillful use of tools and machines, drafting, and working with common materials are basic to industrial arts. Several skills are shared with other subject areas. Problem solving, working effectively with other people, and applying math and science to technical problems can be developed in a variety of courses. However, industrial arts can

TABLE 4

Respondents Ratings of Skills That Could Be Developed in High School Industrial Arts

RANK	Skills	Importance							
		TOTAL		V-T		T Ed		IT	
		$\bar{X}$	%MI	$\bar{X}$	%MI	$\bar{X}$	%MI	$\bar{X}$	%MI
1.	Problem solving.	5.2[#]	53[@]	5.0	42	5.4	58	5.2	54
2.	Effective work habits.	5.1	46	5.3	58	4.9	33	5.2	54
3.	Applying math and science to technical problems and tasks.	4.9	43	5.0	50	4.8	38	4.9	46
4.	Communicating effectively (writing and speaking).	4.9	41	5.0	50	4.9	42	5.2	54
5.	Competency in working with people.	4.8	35	4.9	36	5.0	42	4.8	31
6.	Safe use of tools and equipment.	4.7	33	4.7	33	4.7	33	4.5	31
7.	Study skills	4.5	23	4.8	33	4.4	18	4.5	23
8.	Finding and using technical information.	4.5	21	4.4	25	4.6	22	4.2	8
9.	Using basic tools and machines	4.4	20	4.4	14	4.5	28	4.2	23
10.	Measurement (how to measure)	4.4	18	4.6	19	4.2	13	4.2	15
11.	Leadership	4.1	15	4.0	14	4.2	18	4.0	8
12.	Reading technical materials with understanding .	4.3	13	4.3	19	4.2	5	4.6	31
13.	Evaluating their own work in relation to established standards.	4.2	11	4.3	17	4.1	7	4.3	8
14.	Planning activities and projects	4.1	9	3.8	3	4.3	12	4.1	8
15.	Common applications of a computer.	3.9	9	3.8	11	4.0	10	3.9	0
16.	Drafting fundamentals including CAD.	3.8	8	3.4	6	4.0	10	3.6	0
17.	Reading blueprints	3.8	6	4.1	14	3.6	0	3.8	8
18.	Working with common materials.	3.8	4	3.6	0	3.9	5	3.9	[illegible]
	N	141		36		60		1[illegible]	

#Means are based on the following scale:

1 = NI = Not Important
2 = SI = Slight Importance
3 = MI = Moderate Importance
4 = I = Important
5 = VI = Very Important

NOTE: The Total column is based on the responses of all participants.

@%MI = Percentage of respondents selecting the skill as one of the four most important in this section.

play a unique role in creating the capacity to solve technical problems, use math and science in technical tasks and work effectively in a technical setting.

Competencies Specific To Teaching

Respondents involved in teacher education were asked to evaluate a set of competencies related to teaching. Some respondents from other groups also rated these skills. Thus, the "total" group is larger than the number of educators.

The most important competencies related to teaching were:

- Desire to teach
- Ability to organize information and explain it to others
- Concern for others
- Understanding of the teaching profession and what will be expected of a teacher
- Confidence in working with groups and talking to one's peers

All of the competencies received ratings of 4.7 or higher. This identified them as "very important."

All of the teaching competencies listed in Table 5 received average ratings of 3.9 or higher. In other words, all were important or very important.

Industrial arts teachers should consider enlarging the activities of students who are considering teaching. Encouraging them to participate in teaching activities and sharing information on the industrial arts teaching profession would be valuable.

Summary

A summary of the major findings appears at the beginning of this report.

TABLE 5

Competencies Specifically Related To Teaching

RANK	Knowledge, attitudes and skills specifically related to teaching	Importance TOTAL $\bar{X}$	TOTAL %MI	T Ed $\bar{X}$	T Ed %MI	V TEd $\bar{X}$	V TEd %MI
1.	Desire to teach.	5.1#	40@	5.2	57	5.6	78
2.	Ability to organize information and explain it to others.	5.2	35	5.2	48	5.2	56
3.	Concern for others	4.9	23	4.7	25	5.0	33
4.	Understanding of the teaching profession and what will be expected of one as a teacher	4.8	22	4.8	30	4.6	11
5.	Confidence in working in groups and talking in front of one's peers	4.7	21	4.6	23	4.9	33
6.	Ability to demonstrate and teach skills to others.	4.7	18	4.8	28	4.9	33
7.	Ability to assist and teach others	4.7	16	5.0	32	4.4	0
8.	An understanding of what a teacher does.	4.6	16	4.7	23	4.8	22
9.	Understanding of the career opportunities in teaching industrial arts	4.3	10	4.2	10	4.6	11
10.	Goals of industrial arts programs.	4.2	10	4.3	17	4.4	11
11.	Interest in youth groups and leadership.	4.1	8	4.3	13	4.2	11
12.	Appropriate grooming habits.	4.0	7	4.0	8	4.4	22
13.	Working with exceptional children (talented and slow learners)	3.9	2	3.9	0	5.0	22
	N		101		60		9

#Means are based on the following scale:

1 = NI = Not Important
2 = SI = Slight Importance
3 = MI = Moderate Importance
4 = I = Important
5 = VI = Very Important

NOTE: Some respondents who were not in teacher education also responded. Their responses are included in the "TOTAL" column.

@%MI = Percentage of respondents selecting the competency as one of the three most important in this section.

In addition, it is worthwhile to note that industrial arts can make a significant contribution to the competencies students need as they enter post-secondary programs in technical areas. A variety of competencies developed in industrial arts received important and very important ratings.

The outcome of this study should be helpful in recruiting students for high school industrial arts courses.

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Appendix A

CVTAE
CENTER FOR VOCATIONAL TECHNICAL AND ADULT EDUCATION
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April, 1985

Dear Vocational Educator:

During the last two years we have seen an increasing emphasis on academic subjects at the high school level. High school graduation requirements have been increased and more emphasis has been placed on math, science and English. One result of these changes has been a decrease in the opportunity for students to enroll in industrial arts courses.

The purpose of this study is to identify the knowledge, skills and competencies that can be developed in high school industrial arts courses which are valuable to students who enroll in your programs. The results of this study will help to clarify the role of high school industrial arts in preparing students for post-secondary vocational and technical programs.

Your knowledge and experience with post-secondary vocational and technical programs is very important to this study. Your perceptions and ideas will be very helpful in identifying the role of industrial arts in preparing students for post-secondary vocational programs.

The enclosed survey is the first of two surveys encompassed in this study. On this survey I would like to have you identify the skills and competencies that can be developed in high school industrial arts courses which are most useful to students who enroll in your programs. You do not need to write lengthy answers. Three or four brief responses to each question will be appropriate. I will summarize the responses from all of the people contacted with this survey. This summary will be used to develop a series of competency statements for a rating scale. This rating scale will comprise the second survey which will be mailed out later this spring.

I will need your name and address in order to mail the second survey to you. Please put it on the enclosed survey form.

The results of this study will be very useful in identifying the role of high school industrial arts programs in preparing students for your programs. You will receive a summary of the results of the second survey.

If you have any questions in regard to this survey, please call me. If I am not in my office, leave your question and phone number with my secretary and I will call you back when I return to my office. Your response is appreciated.

Sincerely yours,

Orville Nelson
Post-Secondary and Adult Representative, Industrial Arts Division, AVA

UNIVERSITY OF WISCONSIN-STOUT IS AN EQUAL OPPORTUNITY AND AFFIRMATIVE ACTION UNIVERSITY.

Enclosure

Industrial Arts Competency Survey

Directions: Industrial arts courses have the potential to develop a variety of competencies and skills. Please respond to each of the questions listed below by identifying three or four competencies or skills you think high school industrial arts courses could develop which would be most useful to students who enroll in your program(s).

1. What knowledges can high school industrial arts courses develop that will be useful to students in your programs?

2. What attitudes, interests, and values can high school industrial arts courses develop that would be useful to students in your programs?

3. What skills can high school industrial arts courses develop that will be useful in your programs? (The skill area would include ability to use tools, equipment, computers, etc., in completing technical tasks)

Thank you for responding. Please fill in your name and address below so we can send the second survey to you.

Name _____

Address _____

City/State/Zip Code _____

Please return to Orville Nelson, CVTAE, UW-Stout, Menomonie, WI 54751. (715) 232-1382

CVTAE
CENTER FOR VOCATIONAL TECHNICAL AND ADULT EDUCATION
715-232-1382

UNIVERSITY OF WISCONSIN
STOUT
MENOMONIE WISCONSIN 54751

April, 1985

Dear Industrial Arts Teacher Educator:

High school industrial arts programs face a number of challenges and problems. The general decline in high school enrollments in most school districts, new high school graduation requirements which emphasize academic courses, and rapid changes in technology are examples of these challenges.

Another critical challenge is to enroll sufficient numbers of talented students in our industrial arts teacher education programs. Many teacher education programs report a significant drop in their enrollment. Without an adequate supply of new teachers who are competent and dedicated, it will be difficult to improve the quality of industrial arts programs in our high schools.

The purpose of this study is to identify the competencies and skills that high school industrial arts programs can develop and which would be valuable as students enter your industrial arts teacher education program. With your knowledge, involvement, and concern for industrial arts teacher education your ideas and suggestions are critical to this study.

The enclosed survey is the first of two surveys encompassed in this study. In this survey you were asked to respond to five general questions. Your responses need not be lengthy. I would like to have you write three or four brief responses to each question. Each response should identify a competency or skill you feel is important. It should not take more than ten to fifteen minutes to complete this survey.

I will review the responses to this survey and develop a series of competency and skill statements which summarize the suggestions made by you and other teacher educators. These statements will be placed in the second survey and forwarded to you later this spring. On the second survey you will have an opportunity to rate the importance of each of the competencies and skills that high school industrial arts can develop. The summary of the results of the second survey will be mailed to you next fall.

I realize industrial arts programs are undergoing a name change in a number of regions and states. I have used industrial arts throughout the survey and this letter to represent our field. If you have or are changing the name of your program, please respond to the enclosed survey based on the goals and content of your current program.

Your response to this survey will be sincerely appreciated.

Sincerely yours,

Orville Nelson

Orville Nelson
Adult and Post-Secondary Representative, Industrial Arts Division,
American Vocational Association

UNIVERSITY OF WISCONSIN-STOUT IS AN EQUAL OPPORTUNITY AND AFFIRMATIVE ACTION UNIVERSITY.

Industrial Arts Competency Survey

Teacher Education

Directions: Industrial arts courses have the potential to develop a variety of competencies and skills. Please respond to each of the questions listed below by identifying three or four competencies or skills you think high school industrial arts courses could develop which would be most useful to students who enroll in your program(s).

1. What knowledges can high school industrial arts courses develop that will be useful to students in your programs?

2. What attitudes, interests, and values can high school industrial arts courses develop that would be useful to students in your programs?

3. What skills can high school industrial arts courses develop that will be useful in your programs? (The skill area would include ability to use tools, equipment, computers, etc., in completing technical tasks.)

4. What knowledge, attitudes, or skills related to teaching could high school industrial arts courses develop?

5. What is the name of your teacher preparation program? For example: is it industrial arts teacher education, technology teacher education, etc.?

Appendix B

CVTAE
CENTER FOR VOCATIONAL TECHNICAL AND ADULT EDUCATION
715-232-1382

UNIVERSITY OF WISCONSIN
STOUT
MENOMONIE WISCONSIN 54751

September, 1985

Dear Colleague:

What content should high school industrial arts emphasize? Should this discipline be Technology Education? How will high school courses in this area fare with increased emphasis and requirements for academic subjects? These are major questions that face industrial arts educators at all levels.

The purpose of this study is to identify the knowledge, skills and competencies that can be developed in high school industrial arts courses that are valuable to students who enroll in your programs. The results of this study will help to clarify the role of high school industrial arts in preparing students for post-secondary and college programs.

Your experience and knowledge with post-secondary programs is very important to this study. Your perceptions and judgment will be very helpful in clarifying the role of industrial arts in preparing students for post-high school programs.

The term "industrial arts" is used throughout this letter and survey. I realize that Technology Education and Industrial Education are also commonly used to identify this discipline. However, I thought it would be better to use one term rather than try to list all three terms each time. Please respond from your perspective whether it be industrial arts, technology education or industrial education.

You should be able to complete the enclosed survey in fifteen to twenty minutes. Almost all responses are made by circling your response choices. You may add comments if you desire.

The results of this study will be reported at the 1985 AVA Convention. If you would like to have a summary of the results, place your name and address on the last page of the survey.

If you have any questions in regard to this survey, please call me. If I am not in my office, leave your questions and phone number with my secretary and I will call you.

Your response is appreciated.

Sincerely yours,

Orville Nelson
Post-Secondary and Adult Representative
Industrial Arts Division, AVA

Enclosure

UNIVERSITY OF WISCONSIN-STOUT IS AN EQUAL OPPORTUNITY AND AFFIRMATIVE ACTION UNIVERSITY.

INDUSTRIAL ARTS COMPETENCY SURVEY

I. Knowledge

DIRECTIONS: High school industrial arts courses have the potential to develop a variety of knowledge. Read each of the knowledge statements below and indicate the degree to which they would be useful or important to students who enroll in your programs. Use the following responses. Do not mark in Column 6 until you have completed the section.

1 = NI = Not Important
2 = SI = Slight Importance
3 = MI = Moderate Importance
4 = I = Important
5 = VI = Very Important

Knowledge that high school industrial arts could develop.	Importance NI 1	SI 2	MI 3	I 4	VI 5	6
• Develop knowledge of						
1. career opportunities in industrial arts teaching.	1	2	3	4	5	6
2. career opportunities in technical occupations	1	2	3	4	5	6
3. job-seeking skills.	1	2	3	4	5	6
4. the role and impacts of technology in our world	1	2	3	4	5	6
5. the history of tools and technology	1	2	3	4	5	6
6. human relations skills.	1	2	3	4	5	6
7. problem solving techniques.	1	2	3	4	5	6
8. safe working procedures	1	2	3	4	5	6
9. the nature of craftsmanship	1	2	3	4	5	6
10. how industry is organized and functions	1	2	3	4	5	6
11. basic management techniques	1	2	3	4	5	6
12. basic drafting techniques and concepts.	1	2	3	4	5	6
13. basic construction concepts	1	2	3	4	5	6
14. basic manufacturing concepts.	1	2	3	4	5	6
15. basic energy concepts	1	2	3	4	5	6
16. communications concepts	1	2	3	4	5	6
17. transportation concepts	1	2	3	4	5	6
18. costing materials, supplies and labor	1	2	3	4	5	6
19. basic materials and processes	1	2	3	4	5	6
20. new manufacturing systems such as Computer Integrated Manufacturing (CIM), Flexible Manufacturing (FMS), etc.	1	2	3	4	5	6
21. written and oral communications techniques and skills used in industry.	1	2	3	4	5	6
22. basic technical terms	1	2	3	4	5	6
23. basic applications of science in technology	1	2	3	4	5	6
24. basic applications of math in technology.	1	2	3	4	5	6
25. computer applications in industry	1	2	3	4	5	6
26. entrepreneurship - procedures and problems involved in starting your own business	1	2	3	4	5	6
27. the free enterprise system.	1	2	3	4	5	6
28. change - its impacts on one's personal life and society; and the need to adapt to change	1	2	3	4	5	6
29. Other _____	1	2	3	4	5	6
30 Other _____	1	2	3	4	5	6

31. Identify the five most important knowledges listed in the previous section. In the last column circle the Number 6 after each of these five items

. . . OVER . . .

II. Attitudes, Values and Interests

DIRECTIONS: Read each of the statements concerning attitudes, values and interests listed below. Indicate the degree of importance to students who enroll in your programs. Do not mark in Column 6 until you have completed the section. Use the following responses.

1 = NI = Not Important
2 = SI = Slight Importance
3 = MI = Moderate Importance
4 = I = Important
5 = VI = Important

Attitudes, values and interests that high school industrial arts courses can develop.	Importance NI 1	SI 2	MI 3	I 4	VI 5	6
• Develop a/an						
32. interest in learning about technology	1	2	3	4	5	6
33. appreciation of the importance of work	1	2	3	4	5	6
34. desire to "do it right the first time"	1	2	3	4	5	6
35. appreciation of craftsmanship	1	2	3	4	5	6
36. interest in technical careers	1	2	3	4	5	6
37. interest in learning	1	2	3	4	5	6
38. interest in student organizations	1	2	3	4	5	6
39. self-confidence and self-esteem	1	2	3	4	5	6
40. interest in design and esthetics	1	2	3	4	5	6
41. interpersonal skills - ability to work effectively with others	1	2	3	4	5	6
42. respect for other people and their views	1	2	3	4	5	6
43. interest in working cooperatively with others	1	2	3	4	5	6
44. honesty	1	2	3	4	5	6
45. responsibility	1	2	3	4	5	6
46. pride in their work	1	2	3	4	5	6
47. mental set that encourages curiosity	1	2	3	4	5	6
48. self-discipline	1	2	3	4	5	6
49. positive attitude toward safety	1	2	3	4	5	6
50. positive attitude toward profit	1	2	3	4	5	6
51. Other _____	1	2	3	4	5	6
52. Other _____	1	2	3	4	5	6

53. Identify the five most important attitudes, values and interests in the previous section. In the last column circle the Number 6 after each of these five items.

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III. Skills

DIRECTIONS: Read each of the skill statements below. Indicate the degree of importance to students who enroll in your programs. Do not mark in Column 6 until you have completed the section. Use the following responses.

1 = NI = Not Important
2 = SI = Slight Importance
3 = MI = Moderate Importance
4 = I = Important
5 = VI = Very Important

Skills that high school industrial arts courses could develop.	Importance NI 1	SI 2	MI 3	I 4	VI 5	6
54. Effective work habits	1	2	3	4	5	6
55. Competency in working with people	1	2	3	4	5	6
56. Communicating effectively (writing and speaking)	1	2	3	4	5	6
57. Evaluating their own work in relation to established standards	1	2	3	4	5	6
58. Leadership	1	2	3	4	5	6
59. Applying math and science to technical problems and tasks	1	2	3	4	5	6
60. Reading blueprints	1	2	3	4	5	6
61. Drafting fundamentals including CAD	1	2	3	4	5	6
62. Safe use of tools and equipment	1	2	3	4	5	6
63. Working with common materials	1	2	3	4	5	6
64. Problem solving	1	2	3	4	5	6
65. Planning activities and projects	1	2	3	4	5	6
66. Common applications of a computer	1	2	3	4	5	6
67. Study skills	1	2	3	4	5	6
68. Finding and using technical information	1	2	3	4	5	6
69. Reading technical materials with understanding	1	2	3	4	5	6
70. Measurement (how to measure)	1	2	3	4	5	6
71. Using basic tools and machines	1	2	3	4	5	6
72. Other _____	1	2	3	4	5	6
73. Other _____	1	2	3	4	5	6

74. Identify the four most important skills listed in the previous section. In the last column circle the Number 6 after each of these four items

IV. Competencies Related to Teaching

NOTE: If you teach in a teacher education program, answer the items in the next section. If you do not, go to the last item (91).

DIRECTIONS: Read each of the statements below. Indicate the degree of importance to students who enroll in your programs. Do not mark in Column 6 until you have completed the section. Use the following responses.

1 = NI = Not Important
2 = SI = Slight Importance
3 = MI = Moderate Importance
4 = I = Important
5 = VI = Very Important

Knowledge, attitudes and skills specifically related to teaching.	Importance NI 1	SI 2	MI 3	I 4	VI 5	6
75. Desire to teach.	1	2	3	4	5	6
76. An understanding of what a teacher does.	1	2	3	4	5	6
77. Understanding of the career opportunities in teaching industrial arts.	1	2	3	4	5	6
78. Understanding of the teaching profession and what will be expected of one as a teacher	1	2	3	4	5	6
79. Concern for others	1	2	3	4	5	6
80. Ability to organize information and explain it to others	1	2	3	4	5	6
81. Ability to assist and teach others	1	2	3	4	5	6
82. Ability to demonstrate and teach skills to others.	1	2	3	4	5	6
83. Confidence in working in groups and talking in front of one's peers.	1	2	3	4	5	6
84. Working with exceptional children (talented and slow learners).	1	2	3	4	5	6
85. Goals of industrial arts programs.	1	2	3	4	5	6
86. Interest in youth groups and leadership.	1	2	3	4	5	6
87. Appropriate grooming habits.	1	2	3	4	5	6
88. Other _____	1	2	3	4	5	6
89. Other _____	1	2	3	4	5	6

90. Identify the three most important skills in the previous section. In the last column circle the Number 6 after each of these three items

91. Which of the following best describes the program or department in which you work? Check only one.

_____ 1. One or two-year post-secondary vocational-technical program.
_____ 2. Industrial Arts/Technology Education Teacher Education program/department.
_____ 3. Vocational Teacher Education program/department.
_____ 4. Industrial Technology (non-teaching)
_____ 5. Other _____

If you want a summary of the results, please give your name and address below:

Name _____

Street _____

City _____ State _____ Zip _____

Thank you for responding.

Please return to Orville Nelson
UW-Stout
Menomonie, WI 54751